

ENTOMOLOGICAL NEWS

VOL. XLVI.

MAY, 1935

No. 5

Facts Determined by Rearing Species of *Coniontis* (Coleoptera: Tenebrionidae).

By FRANK E. BLAISDELL, SR., Stanford Medical School and
Associate in Research, California Academy of Sciences,
San Francisco, California.

On April 25th, 1931, the author collected a pair of *Coniontis* Esch., which according to Thos. L. Casey's table was identified as *elongata* Casey. These were secured on Peek's ranch in the Black Lands district, midway between Stockton and Lodi, San Joaquin County, California. The two specimens—male and female—were taken to my laboratory and placed in a breeding jar. Each week the contents of the jar were poured out on paper and carefully examined. Eggs and larvae were soon found. The eggs were laid at varying intervals and the larvae varied in size, indicating differences in age. As the larvae increased in numbers they were divided up into smaller groups and placed in different jars to reduce the chances of cannibalism, and the parental adults were isolated. Sixty larvae were counted. From time to time a limited number of larvae of different ages were preserved in alcohol for study.

The larvae increased in size and began to show evidences of approaching full growth. By August 18th, 1931, many began to be listless, and finally became alternately dormant and active. Their appearance changed, becoming more opaque and filled with fatty bodies. The largest measured 3.5 cm. in length and 3 mm. in width. The larger larvae at this time excavated cells and by March, 1932, pupae were observed, a limited number of which were preserved. In about fourteen days imagos appeared; others appeared in diminishing frequency up to about June 17th, 1932. In August another group of imagos emerged. The number of larvae at this time was reduced to six, these repeated the actions of the earlier larvae and became noticeably

larger than any of those which had pupated. For some reason not determined, these died one by one, although apparently healthy and filled with fatty bodies. The last one was found dead May 19th, 1933. The parental adults continued to live, but produced no more larvae than those mentioned above.

My object in rearing species of Tenebrionidae was to obtain larvae and pupae for specific taxonomic determinations and correlation. It must be kept in mind that the eggs were deposited over a period of several weeks, but none after a certain time. It is not only interesting, but significant that the spring or first adults were referable to *protensa* Casey. The first, a male, was elongate, a little wider in the region of the prothorax and somewhat narrowed to elytral apex, similar to the type which I have seen and studied; elytra and pronotum extremely finely punctate, surface alutaceous or extremely finely reticulo-granulate; prosternal process finely margined at apex and finely punctate; abdomen sparsely punctate. Length 14 mm.; width 6 mm.

The second or late summer group of emergents (August) were like the parents, *clongata* Casey. These were elongate oblong-oval in outline. In all probability the oldest and largest larvae that lived over into 1933, would have developed as *obsidiana* Casey: "The largest species of the group," stout oblong-oval, length 15.5 mm.; width 6.6 mm. These three forms in nature inhabit the same geographical area.

Now, what bearing have the above facts on the specimens collected in the field? Any coleopterist who has taken series of *Coniontis* in any very restricted area, could not have failed to note the differences in size, form and punctuation presented by the specimens. These constitute the problem that caused Col. Casey to describe a considerable number of new species. Specimens that I have collected in the field and others that were reared, have lived from one to two years. The adults hibernate in the soil at considerable depth, during the seasons that are unfavorable to them; those in the breeding jars remain at the bottom of the soil.

I have demonstrated by the rearing of *Coniontis clongata* Casey, that individuals developing from eggs laid by a single female, may develop into at least two, possibly three, forms

which have been recognized as species or subspecies. It is evident, therefore, that these are in the main seasonal phases of but one species. These facts account for the differences observed between individuals taken in the field, excepting of course the possibility of other and distinct species inhabiting the same geographical area. Adults hibernate through one or two winters and appear in the spring and summer, when they occur in vast numbers in some localities. The intermingling of the different phases, of possibly more than one species, constitutes the difficult problem that a taxonomist has to deal with.

Coniontis viatica Esch. has been similarly reared from specimens collected in the suburbs of San Francisco and presents similar facts. The pupae of *Coniontis* are characteristic: They are clothed throughout with a soft, short pubescence, are without anal cerci which are so obvious in other Tenebrionid tribes. In the pupae of *elongata* the pubescence is longer and shaggy on the vertex of the head and apical area of the pronotum. This is not observed in the pupa of *viatica*. These differences point to the probability that the two are distinct species, although their distributional areas may at times overlap.

In 1904, about seventy specimens of *viatica* were collected from an area about a quarter acre in extent, near the Russian River, on the opposite side from Duncan Mills, not far from the railroad bridge, Sonoma County, California. In this series were seen variations analogous to those observed in *elongata*. The different forms were separated and sent to Col. Casey for identification. He returned specimens labeled *lucidula* Casey and *innocua* Casey, leaving the bulk of the series without a name, they being distinctly more strongly punctate. Specimens of *viatica* from the vicinity of San Francisco, include such forms as *timida* Casey and *conicicollis* Casey.

During the month of July, 1934, I collected about Bass Lake, Madera County, California, and secured a large series of a species that I consider to be *Coniontis rotundicollis* Casey. I have taken this species in Yosemite Valley, across the road directly in front of Bridal Veil Falls. They are found under pine needles and chip debris. These are quite typical and best represent the species. The species occurs at altitudes of 4000

to 5000 ft.; at the latter altitude *Coniontis montanus* Casey appears and ranges up to 7500 ft. elevation. Below 3000 ft. a different species occurs. *Rotundicollis* Casey is a distinct species and has definite and constant characters, namely: A highly polished and shining surface, very fine sparse punctation, more or less rufous antennae and tarsi, the prosternal process always strongly strongly margined throughout.

Coniontis montanus Casey is a pubescent and distinct species, constant in facies; it evidently does not develop seasonal forms, as the altitude at which it lives is not favorable. In the extremes of its distributional area north and south it passes into *canonica* Casey (Oregon) and *perspicua* Casey (Tulare County). *Montanus* Casey has been identified as *affinis* Lec. by Dr. George Horn, as observed from specimens in the British Museum, London, examined by me, the name being in Dr. Horn's handwriting. *Affinis* Lec. is also a sparsely pubescent species, of larger size, described from specimens collected at Benecia, California; it may also occur in the Sacramento Valley and bordering foot hills, but not occurring at higher altitudes.

Coniontis blaisdeli Casey was described from specimens collected at Mokelumne Hill, Calaveras County, California. I secured at one collecting a large series from an area not greater than a quarter acre on French Hill at the out-skirts of the town. The series presented an amazing degree of variation, both in form and sculpturing. I am inclined to consider that it is the species which inhabits the eastern foot hills of the great valleys in central California, up to an altitude of about 2000-3000 ft.

Coniontis sanfordi Blais, also occurs in the vicinity of Mokelumne Hill; it is smaller, shorter oblong-oval, with rufous antennae and tarsi and of different habits, lives under the leaves beneath trees in shaded localities. Specimens of a species of similar habits taken on Mt. Tamalpais cannot be separated from those taken at the type locality, elev. 1000-2000 ft.

Casey has made some very pertinent remarks regarding those phases referable to *clongata* and *viatica*, in a foot note in his Revision of the Coniontinae, (Proc. Wash. Acad. of Sciences, vol. X, Apr. 25, 1908, p. 108).

For several years I have had a Review of the Species of *Coniontis* in mind, and have accumulated much material for that purpose. The study has proved very unsatisfactory, as it became increasingly evident that the problems involved had to be solved in some other way than by the study of dried museum specimens. I decided upon rearing the species as the way out of the dilemma. Research in rearing was commenced some four years ago and the study has been most elucidative. The above facts that I have presented will show the trend of the research, and the hopes and suggestions which it offers in finally determining specific limitations where the problems have been most confusing.

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**Another Record of the Occurrence of *Strymon*
ontario in Missouri, with Notes on the
Larva (Lepid.: Lycaenidae).**

By AUSTIN H. CLARK, U. S. National Museum, Washington,
D. C.

Mr. Harold O'Byrne's interesting discovery of *Strymon ontario* in Missouri (ENT. NEWS, vol. 45, 1934, p. 212) led me to investigate in detail the history of a ragged, but unworn, female that long was the sole representative of the species in the collection of the U. S. National Museum.

This specimen was mentioned by Dr. W. J. Holland in 1931 (Butterfly Book, 2nd ed., p. 235) and was figured by myself in 1932 (Bull. 157, U. S. Nat. Mus., pl. 23, figs. 7, 8).

It bears the following labels: "No. 42 L, May 31, 1872," and "Scudder writes Dec. 23, 1875, that this is *autolytus* Edw." The number 42 L refers to notes by Prof. C. V. Riley on file in the Bureau of Entomology, Department of Agriculture, which I have been courteously permitted to consult. These notes, headed *autolytus*, read:

Thecla autolytus Edw. May 8, 1872. Under oak tree, beneath stones and bricks. A rather curious conchiliform larva. Head and first segments retractile. Color dull straw yellow, variegated with pale fulvous and olive green. Minutely granulated with black spots, each giving rise to a short stiff hair. Dorsum narrow, flattened; sides sloping roof-fashion. Venter